

Search Plan and Results

Question

[What is the relationship between the intake of animal protein products and cardiovascular disease? \(DGAC 2010\)](#)

[What is the relationship between the intake of animal protein products and blood pressure? \(DGAC 2010\)](#)

[What is the relationship between the intake of animal protein products and type 2 diabetes? \(DGAC 2010\)](#)

[What is the relationship between the intake of animal protein products and body weight? \(DGAC 2010\)](#)

[What is the relationship between the intake of animal protein products and colorectal cancer? \(DGAC 2010\)](#)

[What is the relationship between the intake of animal protein products and prostate cancer? \(DGAC 2010\)](#)

[What is the relationship between the intake of animal protein products and breast cancer? \(DGAC 2010\)](#)

Date Searched

9/1/09; update 9/18/09

Inclusion Criteria

- January 2000 to September 2009
- Prospective cohort studies on colorectal, breast and prostate cancers
- Human subjects
- English language
- International
- *Sample size:* Minimum of 10 subjects per study arm; preference for larger sizes, if available
- *Dropout rate:* Less than 20%; preference for smaller dropout rates
- *Ages:* Children two to 18 years; Adults 19 years and older
- *Populations:* Healthy, those with elevated chronic disease risk.

Exclusion Criteria

- With the exception of the body weight outcome, cross-sectional studies were excluded from the review
- Systematic reviews and meta-analyses on colorectal, breast and prostate cancers.

Only original research studies with prospective cohort design were included in the review

- Studies specifically related to seafood or milk product intake (considered as separate questions)
- Studies that reported on animal protein intake as a component of a dietary pattern and not as an individual variable
- Medical treatment or therapy
- Diseased subjects (already diagnosed with disease related to study purpose)
- Hospitalized patients
- Study population not from a developed country as defined by the Human Development Index (<http://hdr.undp.org/en/statistics/>)
- Animal studies
- In vitro studies
- Articles not peer reviewed (websites, magazine articles, Federal reports, etc.).

Search Terms: Search Vocabulary

(Animal protein* OR meat[mh] OR "Egg Proteins, Dietary"[mh] OR "Fish Proteins"[mh]) AND ("Diabetes Mellitus, Type 2"[mh] OR "metabolic syndrome X"[mh] OR "overweight"[mh] OR "hypertension"[mh] OR "dyslipidemias"[mh] OR "cardiovascular diseases"[mh:NoExp] OR "heart diseases"[mh] OR "Coronary Disease"[Mesh] OR "blood pressure"[mh] OR "chronic disease"[mh] OR obesity[mh] OR "Body Weights and Measures"[mh] OR "Colorectal Neoplasms"[mesh])

(Animal protein* OR meat[mh] OR "Egg Proteins, Dietary"[mh] OR "Fish Proteins"[mh] OR seafood[majr] OR crustacea[majr]) AND (systematic[sb] OR Meta-Analysis[ptyp] OR "Cohort Studies"[Mesh]) AND ("Prostatic Neoplasms"[Mesh] OR "Breast Neoplasms"[Mesh])

eggs [mh] AND ("Diabetes Mellitus, Type 2"[majr] OR "metabolic syndrome X"[majr] OR "overweight"[majr] OR "hypertension"[majr] OR "dyslipidemias"[majr] OR "cardiovascular diseases"[majr:NoExp] OR "heart diseases"[majr] OR "Coronary Disease"[Mesh] OR "blood pressure"[majr] OR "chronic disease"[majr] OR obesity[majr] OR "Body Weights and Measures"[majr])

(Note: "Cohort Studies"[Mesh]) includes prospective studies)

Electronic Databases

PubMed.

Total hits from all electronic database searches: 771

Total articles identified to review from electronic databases: 166

Articles Identified Via Handsearch or Other Means

Hand Search (two studies):

Järvinen R, Knekt P, Hakulinen T, Rissanen H, Heliövaara M. [Dietary fat, cholesterol and colorectal cancer in a prospective study.](#) *Br J Cancer.* 2001 Aug 3; 85 (3): 357-361. PMID: 11487265; PMCID: PMC2364063.

Wei EK, Giovannucci E, Wu K, Rosner B, Fuchs CS, Willett WC, Colditz GA. [Comparison of risk factors for colon and rectal cancer.](#) *Int J Cancer.* 2004 Jan 20;108 (3): 433-442. PMID: 14648711.

Summary of Articles Identified to Review

Number of Primary Articles Identified: 47

Number of Review Articles Identified: 0

Total Number of Articles Identified: 47

Number of Articles Reviewed but Excluded: 121

List of Articles Included for Evidence Analysis

What is the Relationship Between the Intake of Animal Protein Products and Cardiovascular Disease?

Djoussé L, Gaziano JM. [Egg consumption in relation to cardiovascular disease and mortality: the Physicians' Health Study.](#) *Am J Clin Nutr.* 2008 Apr; 87(4): 964-969. PMID: 18400720; PMCID: PMC2386667.

Halton TL, Willett WC, Liu S, Manson JE, Albert CM, Rexrode K, Hu FB. [Low-carbohydrate-diet score and the risk of coronary heart disease in women.](#) *N Engl J Med.* 2006 Nov 9; 355(19): 1, 991-2, 002. PMID: 17093250.

Kelemen LE, Kushi LH, Jacobs DR Jr, Cerhan JR. [Associations of dietary protein with disease and mortality in a prospective study of postmenopausal women.](#) *Am J Epidemiol.* 2005 Feb 1; 161(3): 239-249. PMID: 15671256.

Nakamura Y, Iso H, Kita Y, Ueshima H, Okada K, Konishi M, Inoue M, Tsugane S. [Egg consumption, serum total cholesterol concentrations and coronary heart disease incidence: Japan Public Health Center-based prospective study.](#) *Br J Nutr.* 2006 Nov; 96(5): 921-928. PMID: 17092383.

Nakamura Y, Okamura T, Tamaki S, Kadokawa T, Hayakawa T, Kita Y, Okayama A, Ueshima H; NIPPON DATA80 Research Group. [Egg consumption, serum cholesterol, and cause-specific and all-cause mortality: The National Integrated Project for Prospective Observation of Non-communicable Disease and Its Trends in the Aged, 1980 \(NIPPON DATA80\).](#) *Am J Clin Nutr.* 2004 Jul; 80(1): 58-63. PMID: 15213028.

Qureshi AI, Suri FK, Ahmed S, Nasar A, Divani AA, Kirmani JF. [Regular egg consumption does not increase the risk of stroke and cardiovascular diseases.](#) *Med Sci Monit.* 2007 Jan; 13(1): CR1-8. Epub 2006 Dec 18. PMID: 17179903.

Sinha R, Cross AJ, Graubard BI, Leitzmann MF, Schatzkin A. [Meat intake and mortality: A prospective study of over half a million people.](#) *Arch Intern Med.* 2009 Mar 23; 169(6): 562-571. PMID: 19307518.

What is the Relationship Between the Intake of Animal Protein Products and Blood Pressure?

Primary Citations

Alonso A, Beunza JJ, Bes-Rastrollo M, Pajares RM, Martinez-González MA. [Vegetable protein and fiber from cereal are inversely associated with the risk of hypertension in a Spanish cohort](#). *Arch Med Res.* 2006 Aug; 37(6): 778-786. PMID: 16824939.

Miura K, Greenland P, Stamler J, Liu K, Daviglus ML, Nakagawa H. [Relation of vegetable, fruit, and meat intake to 7-year blood pressure change in middle-aged men: The Chicago Western Electric Study](#). *Am J Epidemiol.* 2004 Mar 15; 159(6): 572-580. PMID: 15003961.

Steffen LM, Kroenke CH, Yu X, Pereira MA, Slattery ML, Van Horn L, Gross MD, Jacobs DR Jr. [Associations of plant food, dairy product, and meat intakes with 15-year incidence of elevated blood pressure in young black and white adults: The Coronary Artery Risk Development in Young Adults \(CARDIA\) Study](#). *Am J Clin Nutr.* 2005 Dec; 82(6): 1, 169-1, 177; quiz 1, 363-1, 364. PMID: 16332648.

Wagemakers JJ, Prynne CJ, Stephen AM, Wadsworth ME. [Consumption of red or processed meat does not predict risk factors for coronary heart disease: results from a cohort of British adults in 1989 and 1999](#). *Eur J Clin Nutr.* 2009 Mar; 63(3): 303-311. Epub 2007 Nov 14. PMID: 18000518.

Wang YF, Yancy WS Jr, Yu D, Champagne C, Appel LJ, Lin PH. [The relationship between dietary protein intake and blood pressure: Results from the PREMIER study](#). *J Hum Hypertens.* 2008 Nov; 22(11): 745-754. Epub 2008 Jun 26. PMID: 18580887.

What is the Relationship Between the Intake of Animal Protein Products and Type 2 Diabetes?

Djoussé L, Gaziano JM, Buring JE, Lee IM. [Egg consumption and risk of type 2 diabetes in men and women](#). *Diabetes Care.* 2009 Feb; 32(2): 295-300. Epub 2008 Nov 18. PMID: 19017774; PMCID: PMC2628696.

Fung TT, Schulze M, Manson JE, Willett WC, Hu FB. [Dietary patterns, meat intake, and the risk of type 2 diabetes in women](#). *Arch Intern Med.* 2004 Nov 8; 164(20): 2, 235-2, 240. PMID: 15534160.

Halton TL, Liu S, Manson JE, Hu FB. [Low-carbohydrate-diet score and risk of type 2 diabetes in women](#). *Am J Clin Nutr.* 2008 Feb; 87(2): 339-346. PMID: 18258623.

Schulze MB, Manson JE, Willett WC, Hu FB. [Processed meat intake and incidence of type 2 diabetes in younger and middle-aged women](#). *Diabetologia.* 2003 Nov; 46(11): 1, 465-1, 473. Epub 2003 Oct 24. PMID: 14576980.

Song Y, Manson JE, Buring JE, Liu S. [A prospective study of red meat consumption and type 2 diabetes in middle-aged and elderly women: The women's health study](#). *Diabetes Care.* 2004 Sep; 27(9): 2, 108-2, 115. PMID: 15333470.

van Dam RM, Willett WC, Rimm EB, Stampfer MJ, Hu FB. [Dietary fat and meat intake in relation to risk of type 2 diabetes in men](#). *Diabetes Care.* 2002 Mar; 25(3): 417-424. PMID: 11874924.

Vang A, Singh PN, Lee JW, Haddad EH, Brinegar CH. [Meats, processed meats, obesity, weight gain and occurrence of diabetes among adults: Findings from Adventist Health Studies](#). *Ann Nutr Metab.* 2008; 52(2): 96-104. Epub 2008 Mar 18. PMID: 18349528.

What is the Relationship Between the Intake of Animal Protein Products and Body Weight?

Mahon AK, Flynn MG, Stewart LK, McFarlin BK, Iglay HB, Mattes RD, Lyle RM, Considine RV, Campbell WW. [Protein intake during energy restriction: effects on body composition and markers of metabolic and cardiovascular health in postmenopausal women](#). *J Am Coll Nutr.* 2007 Apr; 26(2): 182-189. PMID: 17536130; PMCID: PMC2556253.

Wagemakers JJ, Prynne CJ, Stephen AM, Wadsworth ME. [Consumption of red or processed meat does not predict risk factors for coronary heart disease: Results from a cohort of British adults in 1989 and 1999](#). *Eur J*

Clin Nutr. 2009 Mar; 63(3): 303-311. Epub 2007 Nov 14. PMID: 18000518.

Xu F, Yin XM, Tong SL. [Association between excess bodyweight and intake of red meat and vegetables among urban and rural adult Chinese in Nanjing, China](#). *Asia Pac J Public Health*. 2007; 19(3): 3-9. PubMed PMID: 18330398.

What is the Relationship Between the Intake of Animal Protein Products and Colorectal Cancer?

Chao A, Thun MJ, Connell CJ, McCullough ML, Jacobs EJ, Flanders WD, Rodriguez C, Sinha R, Calle EE. [Meat consumption and risk of colorectal cancer](#). *JAMA*. 2005 Jan 12; 293(2): 172-182. PMID: 15644544.

Cross AJ, Leitzmann MF, Gail MH, Hollenbeck AR, Schatzkin A, Sinha R. [A prospective study of red and processed meat intake in relation to cancer risk](#). *PLoS Med*. 2007 Dec; 4(12): e325. PMID: 18076279; PMCID: PMC2121107.

English DR, MacInnis RJ, Hodge AM, Hopper JL, Haydon AM, Giles GG. [Red meat, chicken, and fish consumption and risk of colorectal cancer](#). *Cancer Epidemiol Biomarkers Prev*. 2004 Sep; 13(9): 1, 509-1, 514. PMID: 15342453.

Flood A, Velie EM, Sinha R, Chaterjee N, Lacey JV Jr, Schairer C, Schatzkin A. [Meat, fat, and their subtypes as risk factors for colorectal cancer in a prospective cohort of women](#). *Am J Epidemiol*. 2003 Jul 1; 158(1): 59-68. PMID: 12835287.

Järvinen R, Knekt P, Hakulinen T, Rissanen H, Heliövaara M. [Dietary fat, cholesterol and colorectal cancer in a prospective study](#). *Br J Cancer*. 2001 Aug 3; 85(3): 357-361. PMID: 11487265; PMCID: PMC2364063. (Hand search)

Kojima M, Wakai K, Tamakoshi K, Tokudome S, Toyoshima H, Watanabe Y, Hayakawa N, Suzuki K, Hashimoto S, Ito Y, Tamakoshi A, Japan Collaborative Cohort Study Group. [Diet and colorectal cancer mortality: Results from the Japan Collaborative Cohort Study](#). *Nutr Cancer*. 2004; 50(1): 23-32. PMID: 15572294.

Larsson SC, Rafter J, Holmberg L, Bergkvist L, Wolk A. [Red meat consumption and risk of cancers of the proximal colon, distal colon and rectum: the Swedish Mammography Cohort](#). *Int J Cancer*. 2005 Feb 20; 113(5): 829-834. PMID: 15499619.

Lee SA, Shu XO, Yang G, Li H, Gao YT, Zheng W. [Animal origin foods and colorectal cancer risk: a report from the Shanghai Women's Health Study](#). *Nutr Cancer*. 2009; 61(2): 194-205. PMID: 19235035.

Norat T, Bingham S, Ferrari P, Slimani N, Jenab M, Mazuir M, Overvad K, Olsen A, Tjønneland A, Clavel F, Boutron-Ruault MC, Kesse E, Boeing H, Bergmann MM, Nieters A, Linseisen J, Trichopoulou A, Trichopoulos D, Tountas Y, Berrino F, Palli D, Panico S, Tumino R, Vineis P, Bueno-de-Mesquita HB, Peeters PH, Engeset D, Lund E, Skeie G, Ardanaz E, González C, Navarro C, Quirós JR, Sanchez MJ, Berglund G, Mattisson I, Hallmans G, Palmqvist R, Day NE, Khaw KT, Key TJ, San Joaquin M, Hémon B, Saracci R, Kaaks R, Riboli E. [Meat, fish, and colorectal cancer risk: the European Prospective Investigation into cancer and nutrition](#). *J Natl Cancer Inst*. 2005 Jun 15; 97(12): 906-916. PMID: 15956652; PMCID: PMC1913932.

Oba S, Shimizu N, Nagata C, Shimizu H, Kametani M, Takeyama N, Ohnuma T, Matsushita S. [The relationship between the consumption of meat, fat, and coffee and the risk of colon cancer: a prospective study in Japan](#). *Cancer Lett*. 2006 Dec 8; 244(2): 260-267. Epub 2006 Mar 6. PMID: 16519996.

Sato Y, Nakaya N, Kuriyama S, Nishino Y, Tsubono Y, Tsuji I. [Meat consumption and risk of colorectal cancer in Japan: the Miyagi Cohort Study](#). *Eur J Cancer Prev*. 2006 Jun; 15(3): 211-218. PMID: 16679863.

Wei EK, Giovannucci E, Wu K, Rosner B, Fuchs CS, Willett WC, Colditz GA. [Comparison of risk factors for colon and rectal cancer](#). *Int J Cancer*. 2004 Jan 20; 108(3): 433-442. PMID: 14648711. (Hand search)

Wu K, Giovannucci E, Byrne C, Platz EA, Fuchs C, Willett WC, Sinha R. [Meat mutagens and risk of distal colon adenoma in a cohort of U.S. men](#). *Cancer Epidemiol Biomarkers Prev*. 2006 Jun; 15(6): 1, 120-1, 125. PMID:

16775169.

What is the Relationship Between the Intake of Animal Protein Products and Prostate Cancer?

Cross AJ, Peters U, Kirsh VA, Andriole GL, Reding D, Hayes RB, Sinha R. [A prospective study of meat and meat mutagens and prostate cancer risk](#). *Cancer Res*. 2005 Dec 15; 65(24): 11, 779-11, 784. PMID: 16357191.

Koutros S, Cross AJ, Sandler DP, Hoppin JA, Ma X, Zheng T, Alavanja MC, Sinha R. [Meat and meat mutagens and risk of prostate cancer in the Agricultural Health Study](#). *Cancer Epidemiol Biomarkers Prev*. 2008 Jan; 17(1): 80-87. PMID: 18199713.

Michaud DS, Augustsson K, Rimm EB, Stampfer MJ, Willet WC, Giovannucci E. [A prospective study on intake of animal products and risk of prostate cancer](#). *Cancer Causes Control*. 2001 Aug; 12(6): 557-567. PMID: 11519764.

Park SY, Murphy SP, Wilkens LR, Henderson BE, Kolonel LN. [Fat and meat intake and prostate cancer risk: The multiethnic cohort study](#). *Int J Cancer*. 2007 Sep 15; 121(6): 1, 339-1, 345. PMID: 17487838.

Rodriguez C, McCullough ML, Mondul AM, Jacobs EJ, Chao A, Patel AV, Thun MJ, Calle EE. [Meat consumption among black and white men and risk of prostate cancer in the Cancer Prevention Study II Nutrition Cohort](#). *Cancer Epidemiol Biomarkers Prev*. 2006 Feb; 15(2): 211-216. PMID: 16492907.

Rohrmann S, Platz EA, Kavaugh CJ, Thuitt L, Hoffman SC, Helzlsouer KJ. [Meat and dairy consumption and subsequent risk of prostate cancer in a US cohort study](#). *Cancer Causes Control*. 2007 Feb; 18(1): 41-50. PMID: 17315319.

What is the Relationship Between the Intake of Animal Protein Products and Breast Cancer?

Cho E, Chen WY, Hunter DJ, Stampfer MJ, Colditz GA, Hankinson SE, Willett WC. [Red meat intake and risk of breast cancer among premenopausal women](#). *Arch Intern Med*. 2006 Nov 13; 166(20): 2, 253-2, 259. PMID: 17101944.

Ferrucci LM, Cross AJ, Graubard BI, Brinton LA, McCarty CA, Ziegler RG, Ma X, Mayne ST, Sinha R. [Intake of meat, meat mutagens, and iron and the risk of breast cancer in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial](#). *Br J Cancer*. 2009 Jul 7; 101(1): 178-184. Epub 2009 Jun 9. PMID: 19513076.

Fung TT, Hu FB, Holmes MD, Rosner BA, Hunter DJ, Colditz GA, Willett WC. [Dietary patterns and the risk of postmenopausal breast cancer](#). *Int J Cancer*. 2005 Aug 10; 116(1): 116-121. PMID: 15756679.

Kabat GC, Cross AJ, Park Y, Schatzkin A, Hollenbeck AR, Rohan TE, Sinha R. [Meat intake and meat preparation in relation to risk of postmenopausal breast cancer in the NIH-AARP diet and health study](#). *Int J Cancer*. 2009 May 15; 124(10): 2, 430-2, 435. PMID: 19165862.

Linos E, Willett WC, Cho E, Colditz G, Frazier LA. [Red meat consumption during adolescence among premenopausal women and risk of breast cancer](#). *Cancer Epidemiol Biomarkers Prev*. 2008 Aug; 17(8): 2, 146-2, 151. Epub 2008 Jul 31. PMID: 18669582.

Taylor EF, Burley VJ, Greenwood DC, Cade JE. [Meat consumption and risk of breast cancer in the UK Women's Cohort Study](#). *Br J Cancer*. 2007 Apr 10; 96(7): 1, 139-1, 146. Erratum in: Br J Cancer. 2007 Jun 4; 96 (11): 1, 780. PMID: 17406351.

Wang L, Manson JE, Buring JE, Sesso HD. [Meat intake and the risk of hypertension in middle-aged and older women](#). *J Hypertens*. 2008 Feb; 26(2): 215-222. PMID: 18192834.

List of Excluded Articles with Reason

Article (A-K)	Reason for Exclusion
Alexander DD, Cushing CA, Lowe KA, Sceurman B, Roberts MA. Meta-analysis of animal fat or animal protein intake and colorectal cancer. <i>Am J Clin Nutr.</i> 2009 May; 89(5): 1, 402-1, 409. Epub 2009 Mar 4. PMID: 19261724.	Study design is meta-analysis (colorectal cancer).
Appleby PN, Davey GK, Key TJ. Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans in EPIC-Oxford. <i>Public Health Nutr.</i> 2002 Oct; 5(5): 645-654. PMID: 12372158.	Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.
Augustsson K, Michaud DS, Rimm EB, Leitzmann MF, Stampfer MJ, Willett WC, Giovannucci E. A prospective study of intake of fish and marine fatty acids and prostate cancer. <i>Cancer Epidemiol Biomarkers Prev.</i> 2003 Jan; 12(1): 64-67. PMID: 12540506.	Does not answer question: Examined relationship between fish intake and prostate cancer.
Azadbakht L, Esmaillzadeh A. Red meat intake is associated with metabolic syndrome and the plasma C-reactive protein concentration in women. <i>J Nutr.</i> 2009 Feb; 139(2): 335-339. Epub 2008 Dec 11. PMID: 19074209.	Does not answer question: Examined relationship between red meat intake and metabolic syndrome.
Balder HF, Vogel J, Jansen MC, Weijenberg MP, van den Brandt PA, Westenbrink S, van der Meer R, Goldbohm RA. Heme and chlorophyll intake and risk of colorectal cancer in the Netherlands cohort study. <i>Cancer Epidemiol Biomarkers Prev.</i> 2006 Apr; 15(4): 717-725. PMID: 16614114.	Does not answer question: Examined relationship between heme and chlorophyll intake and colorectal cancer.
Bandera EV, Kushi LH, Moore DF, Gifkins DM, McCullough ML. Consumption of animal foods and endometrial cancer risk: A systematic literature review and meta-analysis. <i>Cancer Causes Control.</i> 2007 Nov; 18(9): 967-988. Epub 2007 Jul 19. Review. PMID: 17638104; PMCID: PMC2592095.	Does not include colorectal, breast, or prostate cancer in analyses.
Barraj L, Tran N, Mink P. A comparison of egg consumption with other modifiable coronary heart disease lifestyle risk factors: a relative risk apportionment study. <i>Risk Anal.</i> 2009 Mar; 29(3): 401-415. Epub 2008 Nov 4. PMID: 19000074.	Does not answer question: Used risk apportionment approach to estimate contribution of egg intake to coronary heart disease (CHD) risk at the population level.
Benassi-Evans B, Clifton PM, Noakes M, Keogh JB, Fenech M. High protein-high red meat versus high carbohydrate weight loss diets do not differ in effect on genome stability and cell death in lymphocytes of overweight men. <i>Mutagenesis.</i> 2009 May; 24(3): 271-277. Epub 2009 Mar 5. PMID: 19264840.	Does not include animal protein product intake in analyses.
Brink M, Weijenberg MP, de Goeij AF, Roemen GM, Lentjes MH, de Bruïne AP, Goldbohm RA, van den Brandt PA. Meat consumption and K-ras mutations in sporadic colon and rectal cancer in The Netherlands Cohort Study. <i>Br J Cancer.</i> 2005 Apr 11; 92(7): 1, 310-1, 320. PMID: 15812479.	Study design is case-cohort.
Cade JE, Burley VJ, Greenwood DC; UK Women's Cohort Study Steering Group. The UK Women's Cohort Study: Comparison of vegetarians, fish-eaters and meat-eaters. <i>Public Health Nutr.</i> 2004 Oct; 7(7): 871-878. PMID: 15482612.	Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.
Chan AT, Tranae GJ, Giovannucci EL, Willett WC, Hunter DJ, Fuchs CS. Prospective study of N-acetyltransferase-2 genotypes, meat intake, smoking and risk of colorectal cancer. <i>Int J Cancer.</i> 2005 Jul 1; 115(4): 648-652. PMID: 15700302.	Study design is case-control study (colorectal cancer).
Chavarro JE, Stampfer MJ, Hall MN, Sesso HD, Ma J. A 22-y prospective study of fish intake in relation to prostate cancer incidence and mortality. <i>Am J Clin Nutr.</i> 2008 Nov; 88(5): 1, 297-1, 303. PMID: 18996866.	Does not answer question: Examined relationship between fish intake and prostate cancer.

<p>Chrysohou C, Panagiotakos DB, Pitsavos C, Skoumas J, Krinos X, Chloptsios Y, Nikolaou V, Stefanadis C. <u>Long-term fish consumption is associated with protection against arrhythmia in healthy persons in a Mediterranean region: The ATTICA study.</u> <i>Am J Clin Nutr.</i> 2007 May; 85(5): 1, 385-1, 391. PMID: 17490977.</p>	<p>Does not answer question: Examined relationship between fish intake and arrhythmia.</p>
<p>Cotterchio M, Boucher BA, Manno M, Gallinger S, Okey AB, Harper PA. <u>Red meat intake, doneness, polymorphisms in genes that encode carcinogen-metabolizing enzymes, and colorectal cancer risk.</u> <i>Cancer Epidemiol Biomarkers Prev.</i> 2008 Nov; 17(11): 3, 098-3, 107. PMID: 18990750.</p>	<p>Study design is case-control (colorectal cancer).</p>
<p>Crowe FL, Key TJ, Appleby PN, Travis RC, Overvad K, Jakobsen MU, Johnsen NF, Tjønneland A, Linseisen J, Rohrmann S, Boeing H, Pischon T, Trichopoulou A, Lagiou P, Trichopoulos D, Sacerdote C, Palli D, Tumino R, Krogh V, Bueno-de-Mesquita HB, Kiemeneij LA, Chirlaque MD, Ardanaz E, Sánchez MJ, Larrañaga N, González CA, Quirós JR, Manjer J, Wärffel E, Stattin P, Hallmans G, Khaw KT, Bingham S, Ferrari P, Slimani N, Jenab M, Riboli E. <u>Dietary fat intake and risk of prostate cancer in the European Prospective Investigation into Cancer and Nutrition.</u> <i>Am J Clin Nutr.</i> 2008 May; 87(5): 1, 405-1, 413. PMID: 18469265.</p>	<p>Does not answer question: Examined relationship between animal fat intake and prostate cancer.</p>
<p>Dallongeville J, Yarnell J, Ducimetière P, Arveiler D, Ferrières J, Montaye M, Luc G, Evans A, Bingham A, Hass B, Ruidavets JB, Amouyel P. <u>Fish consumption is associated with lower heart rates.</u> <i>Circulation.</i> 2003 Aug 19; 108(7): 820-825. Epub 2003 Aug 11. PMID: 12912821.</p>	<p>Does not answer question: Examined relationship between fish intake and heart rates.</p>
<p>Davey GK, Spencer EA, Appleby PN, Allen NE, Knox KH, Key TJ. <u>EPIC-Oxford: lifestyle characteristics and nutrient intakes in a cohort of 33,883 meat-eaters and 31,546 non meat-eaters in the UK.</u> <i>Public Health Nutr.</i> 2003 May; 6(3): 259-269. PMID: 12740075.</p>	<p>Does not include health outcomes in analyses.</p>
<p>de Mello VD, Zelmanovitz T, Perassolo MS, Azevedo MJ, Gross JL. <u>Withdrawal of red meat from the usual diet reduces albuminuria and improves serum fatty acid profile in type 2 diabetes patients with macroalbuminuria.</u> <i>Am J Clin Nutr.</i> 2006 May; 83(5): 1, 032-1, 038. PMID: 16685043.</p>	<p>Participants diagnosed with type 2 diabetes (T2D).</p>
<p>Dixon LB, Balder HF, Virtanen MJ, Rashidkhani B, Männistö S, Krogh V, van Den Brandt PA, Hartman AM, Pietinen P, Tan F, Virtamo J, Wolk A, Goldbohm RA. <u>Dietary patterns associated with colon and rectal cancer: results from the Dietary Patterns and Cancer (DIETSCAN) Project.</u> <i>Am J Clin Nutr.</i> 2004 Oct; 80(4): 1, 003-1, 011. PMID: 15447912.</p>	<p>Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.</p>
<p>Djoussé L, Gaziano JM. <u>Egg consumption and risk of heart failure in the Physicians' Health Study.</u> <i>Circulation.</i> 2008 Jan 29; 117(4): 512-516. Epub 2008 Jan 14. PMID: 18195171; PMCID: PMC2706003.</p>	<p>Does not answer question: Examined relationship between egg consumption and heart failure.</p>
<p>Egeberg R, Olsen A, Autrup H, Christensen J, Stripp C, Tetens I, Overvad K, Tjønneland A. <u>Meat consumption, N-acetyl transferase 1 and 2 polymorphism and risk of breast cancer in Danish postmenopausal women.</u> <i>Eur J Cancer Prev.</i> 2008 Feb; 17(1): 39-47. PMID: 18090909.</p>	<p>Study design is nested case-control study (breast cancer).</p>
<p>Eichholzer M, Bisig B. <u>Daily consumption of (red) meat or meat products in Switzerland: Results of the 1992/93 Swiss Health Survey.</u> <i>Eur J Clin Nutr.</i> 2000 Feb; 54(2): 136-142. PMID: 10694784.</p>	<p>Does not include health outcomes in analyses.</p>
<p>Elliott P, Stamler J, Dyer AR, Appel L, Dennis B, Kesteloot H, Ueshima H, Okayama A, Chan Q, Garside DB, Zhou B. <u>Association between protein intake and blood pressure: The INTERMAP Study.</u> <i>Arch Intern Med.</i> 2006 Jan 9; 166(1): 79-87. PMID: 16401814.</p>	<p>Study design is cross-sectional epidemiological study.</p>

Engeset D, Andersen V, Hjartåker A, Lund E. Consumption of fish and risk of colon cancer in the Norwegian Women and Cancer (NOWAC) study . <i>Br J Nutr.</i> 2007 Sep; 98(3): 576-582. Epub 2007 Apr 10. Erratum in: <i>Br J Nutr.</i> 2008 Mar; 99(3): 696. PMID: 17419892.	Does not answer question: Examined relationship between fish intake and colon cancer.
Erkkilä AT, Lichtenstein AH, Mozaffarian D, Herrington DM. Fish intake is associated with a reduced progression of coronary artery atherosclerosis in postmenopausal women with coronary artery disease . <i>Am J Clin Nutr.</i> 2004 Sep; 80(3): 626-632. PMID: 15321802.	Participants diagnosed with CHD.
Erkkilä AT, Schwab US, de Mello VD, Lappalainen T, Mussalo H, Lehto S, Kemi V, Lamberg-Allardt C, Uusitupa MI. Effects of fatty and lean fish intake on blood pressure in subjects with coronary heart disease using multiple medications . <i>Eur J Nutr.</i> 2008 Sep; 47(6): 319-328. Epub 2008 Jul 29. PMID: 18665413.	Participants diagnosed with CHD.
Faramawi MF, Johnson E, Fry MW, Sall M, Zhou Y. Consumption of different types of meat and the risk of renal cancer: Meta-analysis of case-control studies . <i>Cancer Causes Control.</i> 2007 Mar; 18(2): 125-133. Epub 2007 Jan 22. Erratum in: <i>Cancer Causes Control.</i> 2007 Jun; 18 (5): 581. Yi, Zhou [corrected to Zhou, Yi]. PMID: 17242980.	Does not include colorectal, breast or prostate cancer in analyses.
Ferrucci LM, Sinha R, Graubard BI, Mayne ST, Ma X, Schatzkin A, Schoenfeld PS, Cash BD, Flood AJ, Cross AJ. Dietary meat intake in relation to colorectal adenoma in asymptomatic women . <i>Am J Gastroenterol.</i> 2009 May; 104(5): 1, 231-1, 140. Epub 2009 Apr 14. PMID: 19367270.	Study design is case-control study (colorectal cancer).
Geelen A, Schouten JM, Kamphuis C, Stam BE, Burema J, Renkema JM, Bakker EJ, van't Veer P, Kampman E. Fish consumption, n-3 fatty acids, and colorectal cancer: a meta-analysis of prospective cohort studies . <i>Am J Epidemiol.</i> 2007 Nov 15; 166(10): 1, 116-1, 125. Epub 2007 Sep 6. PMID: 17823383.	Study design is meta-analysis (colorectal cancer).
Gillum RF, Mussolino ME, Madans JH. Fish consumption and hypertension incidence in African Americans and whites: The NHANES I Epidemiologic Follow-up Study . <i>J Natl Med Assoc.</i> 2001 Apr; 93(4): 124-128. PMID: 12653399; PMCID: PMC2593988.	Does not answer question: Examined relationship between fish intake and hypertension (HTN).
Goldin BR, Brauner E, Adlercreutz H, Ausman LM, Lichtenstein AH. Hormonal response to diets high in soy or animal protein without and with isoflavones in moderately hypercholesterolemic subjects . <i>Nutr Cancer.</i> 2005; 51(1): 1-6. PMID: 15749623.	Does not answer question: Examined hormonal response to diets high in soy or animal protein.
Gonzalez CA, Riboli E. Diet and cancer prevention: Where we are, where we are going . <i>Nutr Cancer.</i> 2006; 56(2): 225-31. Review. PMID: 17474869.	Study design is narrative review.
Grillenberger M, Neumann CG, Murphy SP, Bwibo NO, Weiss RE, Jiang L, Hautvast JG, West CE. Intake of micronutrients high in animal-source foods is associated with better growth in rural Kenyan school children . <i>Br J Nutr.</i> 2006 Feb; 95(2): 379-390. PMID: 16469157.	Study population not from a developed country as defined by the Human Development Index (2009).
Gross JL, Zelmanovitz T, Moulin CC, De Mello V, Perassolo M, Leitão C, Hoefel A, Paggi A, Azevedo MJ. Effect of a chicken-based diet on renal function and lipid profile in patients with type 2 diabetes: a randomized crossover trial . <i>Diabetes Care.</i> 2002 Apr; 25(4): 645-651. PMID: 11919119.	Participants diagnosed with T2D.
Günther AL, Remer T, Kroke A, Buyken AE. Early protein intake and later obesity risk: which protein sources at which time points throughout infancy and childhood are important for body mass index and body fat percentage at 7 y of age? <i>Am J Clin Nutr.</i> 2007 Dec; 86(6): 1, 765-1, 772. PMID: 18065597.	Does not answer question: Examined protein intake during infancy and childhood and body weight outcomes at age seven years.

<p>He K, Song Y, Daviglus ML, Liu K, Van Horn L, Dyer AR, Greenland P. Accumulated evidence on fish consumption and coronary heart disease mortality: A meta-analysis of cohort studies. <i>Circulation</i>. 2004 Jun 8; 109(22): 2, 705-2, 711. PMID: 15184295.</p>	Does not answer question: examined relationship between fish intake and CHD.
<p>High red-meat intake, obesity linked to cancer. <i>Health News</i>. 2002 Feb; 8(2): 9. PMID: 11862847.</p>	News article.
<p>Hodgson JM, Burke V, Beilin LJ, Puddey IB. Partial substitution of carbohydrate intake with protein intake from lean red meat lowers blood pressure in hypertensive persons. <i>Am J Clin Nutr</i>. 2006 Apr; 83(4): 780-787. PMID: 16600928.</p>	Participants diagnosed with HTN.
<p>Hu FB, Manson JE, Willett WC. Types of dietary fat and risk of coronary heart disease: a critical review. <i>J Am Coll Nutr</i>. 2001 Feb; 20(1): 5-19. Review. PMID: 11293467.</p>	Study design is narrative review.
<p>Huncharek M, Kupelnick B, Wheeler L. Dietary cured meat and the risk of adult glioma: A meta-analysis of nine observational studies. <i>J Environ Pathol Toxicol Oncol</i>. 2003; 22(2): 129-137. PMID: 14533876.</p>	Does not include colorectal, breast, or prostate cancer in analyses.
<p>Huncharek M, Kupelnick B. A meta-analysis of maternal cured meat consumption during pregnancy and the risk of childhood brain tumors. <i>Neuroepidemiology</i>. 2004 Jan-Apr; 23(1-2): 78-84. PMID: 14739572.</p>	Does not include colorectal, breast, or prostate cancer in analyses.
<p>Hunninghake DB, Maki KC, Kwiterovich PO Jr, Davidson MH, Dicklin MR, Kafonek SD. Incorporation of lean red meat into a National Cholesterol Education Program Step I diet: A long-term, randomized clinical trial in free-living persons with hypercholesterolemia. <i>J Am Coll Nutr</i>. 2000 Jun; 19(3): 351-360. PMID: 10872897.</p>	Participants diagnosed with hypercholesterolemia.
<p>Iso H, Sato S, Kitamura A, Naito Y, Shimamoto T, Komachi Y. Fat and protein intakes and risk of intraparenchymal hemorrhage among middle-aged Japanese. <i>Am J Epidemiol</i>. 2003 Jan 1; 157(1): 32-39. Erratum in: <i>Am J Epidemiol</i>. 2004 Feb 1; 159(3): 318. PMID: 12505888.</p>	Does not answer question: examined relationship between protein intake and intraparenchymal hemorrhage.
<p>Järvinen R, Knekt P, Rissanen H, Reunonen A. Intake of fish and long-chain n-3 fatty acids and the risk of coronary heart mortality in men and women. <i>Br J Nutr</i>. 2006 Apr; 95(4): 824-829. PMID: 16571163.</p>	Does not answer question: examined relationship between fish intake and CHD.
<p>Jenkins DJ, Wong JM, Kendall CW, Esfahani A, Ng VW, Leong TC, Faulkner DA, Vidgen E, Greaves KA, Paul G, Singer W. The effect of a plant-based low-carbohydrate ("Eco-Atkins") diet on body weight and blood lipid concentrations in hyperlipidemic subjects. <i>Arch Intern Med</i>. 2009 Jun 8; 169(11): 1, 046-1, 054. PMID: 19506174.</p>	Participants diagnosed hyperlipidemia.
<p>Joshi AD, Corral R, Siegmund KD, Haile RW, Le Marchand L, Martínez ME, Ahnen DJ, Sandler RS, Lance P, Stern MC. Red meat and poultry intake, polymorphisms in the nucleotide excision repair and mismatch repair pathways and colorectal cancer risk. 2009 Mar; 30(3): 472-479. Epub 2008 Nov 24. PMID: 19029193; PMCID: PMC2722151.</p>	Study design is case-control family-based study (colorectal cancer).
<p>Kabat GC, Miller AB, Jain M, Rohan TE. A cohort study of dietary iron and heme iron intake and risk of colorectal cancer in women. <i>Br J Cancer</i>. 2007 Jul 2; 97 (1): 118-122. Epub 2007 Jun 5. Erratum in: <i>Br J Cancer</i>. 2007 Dec 3; 97(11): 1, 600. PMID: 177551493; PMCID: PMC2359661.</p>	Does not answer question: examined relationship between iron and heme iron intake and colorectal cancer.
<p>König A, Bouzan C, Cohen JT, Connor WE, Kris-Etherton PM, Gray GM, Lawrence RS, Savitz DA, Teutsch SM. A quantitative analysis of fish consumption and coronary heart disease mortality. <i>Am J Prev Med</i>. 2005 Nov; 29(4): 335-346. PMID: 16242600.</p>	Does not answer question: examined relationship between fish intake and CHD.
<p>Kono S. Secular trend of colon cancer incidence and mortality in relation to fat and meat intake in Japan. <i>Eur J Cancer Prev</i>. 2004 Apr; 13(2): 127-132. PMID: 15100579.</p>	Study design is non-comparative, correlational study.

Kontogianni MD, Panagiotakos DB, Pitsavos C, Chrysohoou C, Stefanadis C. Relationship between meat intake and the development of acute coronary syndromes: the CARDIO2000 case-control study . <i>Eur J Clin Nutr</i> . 2008 Feb; 62(2): 171-177. Epub 2007 Mar 14. PMID: 17356558.	Does not include health outcome of interest in analyses.
Kris-Etherton PM, Harris WS, Appel LJ; American Heart Association. Nutrition Committee. Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease . <i>Circulation</i> . 2002 Nov 19; 106(21): 2, 747-2, 757. Erratum in: <i>Circulation</i> . 2003 Jan 28; 107 (3): 512. PMID: 12438303.	Expert opinion.

Article (L-S)	Reason for Exclusion
Larsson SC, Orsini N, Wolk A. Processed meat consumption and stomach cancer risk: A meta-analysis . <i>J Natl Cancer Inst</i> . 2006 Aug 2; 98(15): 1, 078-1, 087. PMID: 16882945.	Does not include colorectal, breast or prostate cancer in analyses.
Larsson SC, Wolk A. Meat consumption and risk of colorectal cancer: A meta-analysis of prospective studies . <i>Int J Cancer</i> . 2006 Dec 1; 119(11): 2, 657-2, 664. PMID: 16991129.	Study design is meta-analysis (colorectal cancer).
Lee JE, Spiegelman D, Hunter DJ, Albanes D, Bernstein L, van den Brandt PA, Buring JE, Cho E, English DR, Freudenheim JL, Giles GG, Graham S, Horn-Ross PL, Håkansson N, Leitzmann MF, Männistö S, McCullough ML, Miller AB, Parker AS, Rohan TE, Schatzkin A, Schouten LJ, Sweeney C, Willett WC, Wolk A, Zhang SM, Smith-Warner SA. Fat, protein, and meat consumption and renal cell cancer risk: A pooled analysis of 13 prospective studies . <i>J Natl Cancer Inst</i> . 2008 Dec 3; 100(23): 1, 695-1, 706. Epub 2008 Nov 25. PMID: 19033572; PMCID: PMC2727138.	Does not include colorectal, breast or prostate cancer in analyses.
Levitin EB, Wolk A, Mittleman MA. Fish consumption, marine omega-3 fatty acids, and incidence of heart failure: A population-based prospective study of middle-aged and elderly men . <i>Eur Heart J</i> . 2009 Jun; 30(12): 1, 495-1, 500. Epub 2009 Apr 21. PMID: 19383731; PMCID: PMC2695952.	Does not answer question: Examined relationship between fish intake and heart failure.
Lichtenstein AH, Jalbert SM, Adlercreutz H, Goldin BR, Rasmussen H, Schaefer EJ, Ausman LM. Lipoprotein response to diets high in soy or animal protein with and without isoflavones in moderately hypercholesterolemic subjects . <i>Arterioscler Thromb Vasc Biol</i> . 2002 Nov 1; 22(11): 1, 852-1, 858. PMID: 12426215.	Participants diagnosed with hypercholesterolemia.
Linseisen J, Kesse E, Slimani N; EPIC Working Group on Dietary Pattern, Subgroup Meat. Meat consumption in Europe: Results from the EPIC study . <i>IARC Sci Publ</i> . 2002; 156: 211-212. PMID: 12484168.	Does not include health outcomes in analyses.
Liu L, Ikeda K, Yamori Y; WHO-CARDIAC Study Group. Inverse relationship between urinary markers of animal protein intake and blood pressure in Chinese: results from the WHO Cardiovascular Diseases and Alimentary Comparison (CARDIAC) Study . <i>Int J Epidemiol</i> . 2002 Feb; 31(1): 227-233. PMID: 11914325.	Does not answer question: Examined the relationship between urinary excretion of 3-methylhistidine (as marker of animal protein intake) and blood pressure (BP).
Lucey AJ, Paschos GK, Cashman KD, Martínez JA, Thorsdottir I, Kiely M. Influence of moderate energy restriction and seafood consumption on bone turnover in overweight young adults . <i>Am J Clin Nutr</i> . 2008 Apr; 87(4): 1, 045-1, 052. PMID: 18400730.	Does not include health outcome of interest in analyses.

<p>Lüchtenborg M, Weijenberg MP, de Goeij AF, Wark PA, Brink M, Roemen GM, Lentjes MH, de Bruïne AP, Goldbohm RA, van 't Veer P, van den Brandt PA. Meat and fish consumption, APC gene mutations and hMLH1 expression in colon and rectal cancer: A prospective cohort study (The Netherlands). <i>Cancer Causes Control</i>. 2005 Nov; 16(9): 1, 041-1, 054. PMID: 16184469.</p>	<p>Results reported based on the same dataset as Brink, 2005.</p>
<p>Mamo JC, James AP, Soares MJ, Griffiths DG, Purcell K, Schwenke JL. A low-protein diet exacerbates postprandial chylomicron concentration in moderately dyslipidaemic subjects in comparison to a lean red meat protein-enriched diet. <i>Eur J Clin Nutr</i>. 2005 Oct; 59(10): 1, 142-1, 148. PMID: 16015257.</p>	<p>Does not answer question: Examined relationship between protein intake and postprandial response.</p>
<p>Männistö S, Dixon LB, Balder HF, Virtanen MJ, Krogh V, Khani BR, Berrino F, van den Brandt PA, Hartman AM, Pietinen P, Tan F, Wolk A, Goldbohm RA. Dietary patterns and breast cancer risk: Results from three cohort studies in the DIETSCAN project. <i>Cancer Causes Control</i>. 2005 Aug; 16(6): 725-733. PMID: 16049811.</p>	<p>Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.</p>
<p>Marques-Vidal P, Ravasco P, Ermelinda Camilo M. Foodstuffs and colorectal cancer risk: A review. <i>Clin Nutr</i>. 2006 Feb; 25(1): 14-36. Epub 2005 Nov 14. Review. PMID: 16290272.</p>	<p>Study design is systematic review (colorectal cancer).</p>
<p>Matheson EM, Mainous AG 3rd, Hill EG, Carnemolla MA. Shellfish consumption and risk of coronary heart disease. <i>J Am Diet Assoc</i>. 2009 Aug; 109(8): 1, 422-1, 426. PMID: 19631050.</p>	<p>Does not answer question: Examined relationship between shellfish intake and CHD.</p>
<p>Matthan NR, Jalbert SM, Ausman LM, Kuvlin JT, Karas RH, Lichtenstein AH. Effect of soy protein from differently processed products on cardiovascular disease risk factors and vascular endothelial function in hypercholesterolemic subjects. <i>Am J Clin Nutr</i>. 2007 Apr; 85(4): 960-966. Erratum in: <i>Am J Clin Nutr</i>. 2007 Aug; 86(2): 525. PMID: 17413093.</p>	<p>Participants were hypercholesterolemic.</p>
<p>McCarty MF. The origins of western obesity: A role for animal protein? <i>Med Hypotheses</i>. 2000 Mar; 54(3): 488-494. PMID: 10783494.</p>	<p>Study design is narrative review.</p>
<p>McNaughton SA, Mishra GD, Stephen AM, Wadsworth ME. Dietary patterns throughout adult life are associated with body mass index, waist circumference, blood pressure, and red cell folate. <i>J Nutr</i>. 2007 Jan; 137(1): 99-105. PMID: 17182808.</p>	<p>Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.</p>
<p>Melanson K, Gootman J, Myrdal A, Kline G, Rippe JM. Weight loss and total lipid profile changes in overweight women consuming beef or chicken as the primary protein source. <i>Nutrition</i>. 2003 May; 19(5): 409-414. PMID: 12714091.</p>	<p>Dropout rate is higher than inclusion criteria.</p>
<p>Missmer SA, Smith-Warner SA, Spiegelman D, Yaun SS, Adami HO, Beeson WL, van den Brandt PA, Fraser GE, Freudenheim JL, Goldbohm RA, Graham S, Kushi LH, Miller AB, Potter JD, Rohan TE, Speizer FE, Toniolo P, Willett WC, Wolk A, Zeleniuch-Jacquotte A, Hunter DJ. Meat and dairy food consumption and breast cancer: A pooled analysis of cohort studies. <i>Int J Epidemiol</i>. 2002 Feb; 31(1): 78-85. PMID: 11914299.</p>	<p>Study design is meta-analysis (breast cancer).</p>
<p>Möllsten AV, Dahlquist GG, Stattin EL, Rudberg S. Higher intakes of fish protein are related to a lower risk of microalbuminuria in young Swedish type 1 diabetic patients. <i>Diabetes Care</i>. 2001 May; 24(5): 805-810. PMID: 11347734.</p>	<p>Participants diagnosed with T2D.</p>
<p>Mortensen LS, Hartvigsen ML, Brader LJ, Astrup A, Schrezenmeir J, Holst JJ, Thomsen C, Hermansen K. Differential effects of protein quality on postprandial lipemia in response to a fat-rich meal in type 2 diabetes: comparison of whey, casein, gluten, and cod protein. <i>Am J Clin Nutr</i>. 2009 Jul; 90(1): 41-48. Epub 2009 May 20. PMID: 19458012.</p>	<p>Participants diagnosed with T2D.</p>

Mozaffarian D, Psaty BM, Rimm EB, Lemaitre RN, Burke GL, Lyles MF, Lefkowitz D, Siscovick DS. Fish intake and risk of incident atrial fibrillation . <i>Circulation</i> . 2004 Jul 27; 110(4): 368-373. Epub 2004 Jul 19. PMID: 15262826; PMCID: PMC1201400.	Does not answer question: Examined relationship between fish intake and atrial fibrillation.
Nagata C, Shimizu H, Kametani M, Takeyama N, Ohnuma T, Matsushita S. Diet and colorectal adenoma in Japanese males and females . <i>Dis Colon Rectum</i> . 2001 Jan; 44(1): 105-111. PMID: 11805576.	Study design is case-control study (colorectal cancer).
Nenseter MS, Østerud B, Larsen T, Strøm E, Bergei C, Hewitt S, Holven KB, Hagve TA, Mjøs SA, Solvang M, Pettersen J, Opstvedt J, Ose L. Effect of Norwegian fish powder on risk factors for coronary heart disease among hypercholesterolemic individuals . <i>Nutr Metab Cardiovasc Dis</i> . 2000 Dec; 10(6): 323-330. PMID: 11302007.	Did not answer question: Examined relationship between fish powder and CHD.
Nettleton JA, Steffen LM, Loehr LR, Rosamond WD, Folsom AR. Incident heart failure is associated with lower whole-grain intake and greater high-fat dairy and egg intake in the Atherosclerosis Risk in Communities (ARIC) study . <i>J Am Diet Assoc</i> . 2008 Nov; 108(11): 1, 881-1, 887. PMID: 18954578; PMCID: PMC2650810.	Does not answer question: Examined relationship between egg intake and heart failure.
Nkondjock A, Receveur O. Fish-seafood consumption, obesity, and risk of type 2 diabetes: an ecological study . <i>Diabetes Metab</i> . 2003 Dec; 29(6): 635-642. PMID: 14707894.	Does not answer question: Examined relationship between fish intake and T2D.
Norat T, Lukanova A, Ferrari P, Riboli E. Meat consumption and colorectal cancer risk: Dose-response meta-analysis of epidemiological studies . <i>Int J Cancer</i> . 2002 Mar 10; 98(2): 241-256. PMID: 11857415.	Study design is meta-analysis (colorectal cancer).
Norat T, Riboli E. Meat consumption and colorectal cancer: A review of epidemiologic evidence . <i>Nutr Rev</i> . 2001 Feb; 59(2): 37-47. Review. PMID: 11310774.	Study design is meta-analysis (colorectal cancer).
Norat T, Riboli E. Meat consumption and colorectal cancer: A review of epidemiologic evidence . <i>Nutr Rev</i> . 2001 Feb; 59(2): 37-47. Review. PMID: 11310774.	Study design is narrative review (colorectal cancer).
Nowson CA, Wattanapenpaiboon N, Pachett A. Low-sodium Dietary Approaches to Stop Hypertension-type diet including lean red meat lowers blood pressure in postmenopausal women . <i>Nutr Res</i> . 2009 Jan; 29(1): 8-18. PMID: 19185772.	Does not include animal protein products in analyses.
Olmedilla-Alonso B, Granado-Lorencio F, Herrero-Barbudo C, Blanco-Navarro I, Blázquez-García S, Pérez-Sacristán B. Consumption of restructured meat products with added walnuts has a cholesterol-lowering effect in subjects at high cardiovascular risk: a randomised, crossover, placebo-controlled study . <i>J Am Coll Nutr</i> . 2008 Apr; 27(2): 342-348. PMID: 18689569.	Does not answer question: Examined effect of restructured meat product on cholesterol.
Panagiotakos DB, Pitsavos C, Zampelas A, Chrysohoou C, Griffin BA, Stefanadis C, Toutouzas P. Fish consumption and the risk of developing acute coronary syndromes: The CARDIO2000 study . <i>Int J Cardiol</i> . 2005 Jul 20; 102(3): 403-409. PMID: 16004884.	Does not answer question: Examined relationship between fish intake and health outcomes.
Panagiotakos DB, Zeimbekis A, Boutziouka V, Economou M, Kourlaba G, Toutouzas P, Polychronopoulos E. Long-term fish intake is associated with better lipid profile, arterial blood pressure, and blood glucose levels in elderly people from Mediterranean islands (MEDIS epidemiological study) . <i>Med Sci Monit</i> . 2007 Jul; 13(7): CR307-CR312. PMID: 17599024.	Does not answer question: Examined relationship between fish intake and health outcomes.
Pham TM, Fujino Y, Kubo T, Ide R, Tokui N, Mizoue T, Ogimoto I, Matsuda S, Yoshimura T. Fish intake and the risk of fatal prostate cancer: Findings from a cohort study in Japan . <i>Public Health Nutr</i> . 2009 May; 12(5): 609-613. Epub 2008 Jul 29. PMID: 18664313.	Does not answer question: Examined relationship between fish intake and prostate cancer.

Pieniak Z, Verbeke W, Perez-Cueto F, Brunsø K, De Henauw S. Fish consumption and its motives in households with versus without self-reported medical history of CVD: A consumer survey from five European countries . <i>BMC Public Health</i> . 2008 Sep 10; 8: 306. PMID: 18783593; PMCID: PMC2556335.	Does not include health outcomes in analyses.
Processed meat consumption linked to type 2 diabetes . <i>Nephrol News Issues</i> . 2002 Apr; 16(5): 68-69. PMID: 11962157.	News article.
Ramel A, Parra D, Martinéz JA, Kiely M, Thorsdottir I. Effects of seafood consumption and weight loss on fasting leptin and ghrelin concentrations in overweight and obese European young adults . <i>Eur J Nutr</i> . 2009 Mar; 48(2): 107-114. Epub 2009 Jan 13. PMID: 19142567.	Does not answer question: Examined relationship between seafood and leptin and ghrelin concentrations.
Rosell M, Appleby P, Spencer E, Key T. Weight gain over 5 years in 21,966 meat-eating, fish-eating, vegetarian, and vegan men and women in EPIC-Oxford . <i>Int J Obes (Lond)</i> . 2006 Sep; 30(9): 1, 389-1, 396. Epub 2006 Mar 14. PMID: 16534521.	Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.
Sandhu MS, White IR, McPherson K. Systematic review of the prospective cohort studies on meat consumption and colorectal cancer risk: A meta-analytical approach . <i>Cancer Epidemiol Biomarkers Prev</i> . 2001 May; 10(5): 439-446. PMID: 11352852.	Study design is systematic review/meta-analysis (colorectal cancer).
Santarelli RL, Pierre F, Corpet DE. Processed meat and colorectal cancer: A review of epidemiologic and experimental evidence . <i>Nutr Cancer</i> . 2008; 60(2): 131-144. Review. PMID: 18444144; PMCID: PMC2661797.	Study design is narrative review.
Satia JA, Tseng M, Galanko JA, Martin C, Sandler RS. Dietary patterns and colon cancer risk in Whites and African Americans in the North Carolina Colon Cancer Study . <i>Nutr Cancer</i> . 2009; 61(2): 179-193. PMID: 19235034.	Study design is case-control study (colon cancer).
Schulz M, Hoffmann K, Weikert C, Nöthlings U, Schulze MB, Boeing H. Identification of a dietary pattern characterized by high-fat food choices associated with increased risk of breast cancer: the European Prospective Investigation into Cancer and Nutrition (EPIC)-Potsdam Study . <i>Br J Nutr</i> . 2008 Nov; 100(5): 942-946. PMID: 18377685.	Does not answer question: Examines relationship between high fat foods and breast cancer.
Seierstad SL, Seljeflot I, Johansen O, Hansen R, Haugen M, Rosenlund G, Frøyland L, Arnesen H. Dietary intake of differently fed salmon: The influence on markers of human atherosclerosis . <i>Eur J Clin Invest</i> . 2005 Jan; 35(1): 52-59. PMID: 15638820.	Participants diagnosed with T2D.
Shiell AW, Campbell-Brown M, Haselden S, Robinson S, Godfrey KM, Barker DJ. High-meat, low-carbohydrate diet in pregnancy: Relation to adult blood pressure in the offspring . <i>Hypertension</i> . 2001 Dec 1; 38(6): 1, 282-1, 288. PMID: 11751704.	Does not answer question: Examines relationship between dietary intake during pregnancy and health of adult offspring.
Sieri S, Krogh V, Muti P, Micheli A, Pala V, Crosignani P, Berrino F. Fat and protein intake and subsequent breast cancer risk in postmenopausal women . <i>Nutr Cancer</i> . 2002; 42(1): 10-17. PMID: 12235640.	Study design is case-control study (breast cancer).
Skjelbred CF, Sæbø M, Hjartåker A, Grotmol T, Hansteen IL, Tveit KM, Hoff G, Kure EH. Meat, vegetables and genetic polymorphisms and the risk of colorectal carcinomas and adenomas . <i>BMC Cancer</i> . 2007 Dec 19; 7: 228. PMID: 18093316; PMCID: PMC2228310.	Study design is case-control study (colorectal cancer).
Smith DR, Wood R, Tseng S, Smith SB. Increased beef consumption increases apolipoprotein A-I but not serum cholesterol of mildly hypercholesterolemic men with different levels of habitual beef intake . <i>Exp Biol Med (Maywood)</i> . 2002 Apr; 227(4): 266-275. PMID: 11910049.	Participants diagnosed with mild hypercholesterolemia.
SoRelle R. Fish and long-chain omega-3 fatty acids could be lifesavers for diabetic women . <i>Circulation</i> . 2003 Apr 22; 107(15): e9, 033-9, 035. PMID: 12707254.	Participants were diagnosed with diabetes.

Sørensen M, Autrup H, Olsen A, Tjønneland A, Overvad K, Raaschou-Nielsen O. Prospective study of NAT1 and NAT2 polymorphisms, tobacco smoking and meat consumption and risk of colorectal cancer . <i>Cancer Lett.</i> 2008 Aug 8; 266(2): 186-193. Epub 2008 Mar 26. PMID: 18372103.	Study design is case-control study (colorectal cancer).
Spencer EA, Appleby PN, Davey GK, Key TJ. Diet and body mass index in 38000 EPIC-Oxford meat-eaters, fish-eaters, vegetarians and vegans . <i>Int J Obes Relat Metab Disord.</i> 2003 Jun; 27(6): 728-734. PMID: 12833118.	Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.
Stewart JW, Kaplan ML, Beitz DC. Pork with a high content of polyunsaturated fatty acids lowers LDL cholesterol in women . <i>Am J Clin Nutr.</i> 2001 Aug; 74(2): 179-187. PMID: 11470718.	Intervention consisted of modified pork high in PUFAs.

Article (T-Z)	Reason for Exclusion
Tanskanen A, Hibbeln JR, Tuomilehto J, Uutela A, Haukkala A, Viinamäki H, Lehtonen J, Vartiainen E. Fish consumption and depressive symptoms in the general population in Finland . <i>Psychiatr Serv.</i> 2001 Apr; 52(4): 529-531. PMID: 11274502.	Does not include health outcome of interest in analyses.
Tapola NS, Lyyra ML, Karvonen HM, Usuitupa MI, Sarkkinen ES. The effect of meat products enriched with plant sterols and minerals on serum lipids and blood pressure . <i>Int J Food Sci Nutr.</i> 2004 Aug; 55(5): 389-397. PMID: 15545047.	Intervention consisted of meat products enriched with plant sterols; participants diagnosed with hypercholesterolemia.
Tappel A. Heme of consumed red meat can act as a catalyst of oxidative damage and could initiate colon, breast and prostate cancers, heart disease and other diseases . <i>Med Hypotheses.</i> 2007; 68(3): 562-564. Epub 2006 Oct 11. PMID: 17045417.	Study design is narrative review.
Teixeira Rde C, Molina Mdel C, Zandonade E, Mill JG. Cardiovascular risk in vegetarians and omnivores: A comparative study . <i>Arq Bras Cardiol.</i> 2007 Oct; 89(4): 237-244. English, Portuguese. PMID: 17992380.	Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.
Terry P, Rohan TE, Wolk A, Maehle-Schmidt M, Magnusson C. Fish consumption and breast cancer risk . <i>Nutr Cancer.</i> 2002; 44(1): 1-6. PMID: 12672635.	Study design is case-control study (breast cancer).
Thorsdottir I, Birgisdottir B, Kiely M, Martinez J, Bandarra N. Fish consumption among young overweight European adults and compliance to varying seafood content in four weight loss intervention diets . <i>Public Health Nutr.</i> 2009 May; 12(5): 592-598. Epub 2008 Jun 19. PMID: 18561865.	Does not answer question: Examined compliance to eating varying types of seafood in weight loss intervention diets.
Thorsdottir I, Tomasson H, Gunnarsdottir I, Gisladottir E, Kiely M, Parra MD, Bandarra NM, Schaafsma G, Martinéz JA. Randomized trial of weight-loss-diets for young adults varying in fish and fish oil content . <i>Int J Obes (Lond).</i> 2007 Oct; 31(10): 1, 560-1, 566. Epub 2007 May 15. PMID: 17502874.	Does not answer question: Examined fish intake and weight loss.
Tiemersma EW, Kampman E, Bueno de Mesquita HB, Bunschoten A, van Schothorst EM, Kok FJ, Kromhout D. Meat consumption, cigarette smoking, and genetic susceptibility in the etiology of colorectal cancer: results from a Dutch prospective study . <i>Cancer Causes Control.</i> 2002 May; 13(4): 383-393. PMID: 12074508.	Study design is case-control study (colorectal cancer).

<p>Timonen M, Horrobin D, Jokelainen J, Laitinen J, Herva A, Räsänen P. Fish consumption and depression: The Northern Finland 1966 birth cohort study. <i>J Affect Disord.</i> 2004 Nov 1; 82(3): 447-452. PMID: 15555697.</p>	<p>Does not include health outcome of interest in analyses.</p>
<p>Tzoulaki I, Brown IJ, Chan Q, Van Horn L, Ueshima H, Zhao L, Stamler J, Elliott P; International Collaborative Research Group on Macro-/Micronutrients and Blood Pressure. Relation of iron and red meat intake to blood pressure: cross sectional epidemiological study. <i>BMJ.</i> 2008 Jul 15; 337: a258. doi: 10.1136/bmj.a258. PMID: 18632704; PMCID: PMC2658466.</p>	<p>Study design is cross-sectional epidemiological study.</p>
<p>Umesawa M, Sato S, Imano H, Kitamura A, Shimamoto T, Yamagishi K, Tanigawa T, Iso H. Relations between protein intake and blood pressure in Japanese men and women: the Circulatory Risk in Communities Study (CIRCS). <i>Am J Clin Nutr.</i> 2009 Aug; 90(2): 377-384. Epub 2009 Jun 10. PMID: 19515740.</p>	<p>Study design is cross-sectional.</p>
<p>Varraso R, Jiang R, Barr RG, Willett WC, Camargo CA Jr. Prospective study of cured meats consumption and risk of chronic obstructive pulmonary disease in men. <i>Am J Epidemiol.</i> 2007 Dec 15; 166(12): 1, 438-1, 445. Epub 2007 Sep 4. PMID: 17785711; PMCID: PMC2573990.</p>	<p>Does not include health outcome of interest in analyses.</p>
<p>Virtanen JK, Mozaffarian D, Chiuve SE, Rimm EB. Fish consumption and risk of major chronic disease in men. <i>Am J Clin Nutr.</i> 2008 Dec; 88(6): 1, 618-1, 625. PubMed PMID: 19064523; PMCID: PMC2613199.</p>	<p>Does not answer question: Examined relationship between fish intake and chronic disease.</p>
<p>Wakai K, Tamakoshi K, Date C, Fukui M, Suzuki S, Lin Y, Niwa Y, Nishio K, Yatsuya H, Kondo T, Tokudome S, Yamamoto A, Toyoshima H, Tamakoshi A; JACC Study Group. Dietary intakes of fat and fatty acids and risk of breast cancer: a prospective study in Japan. <i>Cancer Sci.</i> 2005 Sep; 96(9): 590-599. PMID: 16128744.</p>	<p>Does not answer question: Examined relationship between breast cancer and fat intake, not animal protein.</p>
<p>Weggemans RM, Zock PL, Katan MB. Dietary cholesterol from eggs increases the ratio of total cholesterol to high-density lipoprotein cholesterol in humans: A meta-analysis. <i>Am J Clin Nutr.</i> 2001 May; 73(5): 885-891. PMID: 11333841.</p>	<p>Does not examine relationship between intake of animal protein product and health outcome.</p>
<p>Weighuber D, Widhalm K. Effect of 3-month treatment of children and adolescents with familial and polygenic hypercholesterolaemia with a soya-substituted diet. <i>Br J Nutr.</i> 2008 Feb; 99(2): 281-286. Epub 2007 Aug 13. PMID: 17697400.</p>	<p>Participants diagnosed with hypercholesterolemia.</p>
<p>Welch AA, Bingham SA, Ive J, Friesen MD, Wareham NJ, Riboli E, Khaw KT. Dietary fish intake and plasma phospholipid n-3 polyunsaturated fatty acid concentrations in men and women in the European Prospective Investigation into Cancer-Norfolk United Kingdom cohort. <i>Am J Clin Nutr.</i> 2006 Dec; 84(6): 1, 330-1, 339. PMID: 17158413.</p>	<p>Does not include health outcomes in analyses; fish is the independent variable.</p>
<p>Wu K, Hu FB, Willett WC, Giovannucci E. Dietary patterns and risk of prostate cancer in U.S. men. <i>Cancer Epidemiol Biomarkers Prev.</i> 2006 Jan; 15(1): 167-171. PMID: 16434606.</p>	<p>Does not include animal protein product intake, specifically, in analyses. Examined dietary patterns.</p>
<p>Yoon H, Benamouzig R, Little J, François-Collange M, Tomé D. Systematic review of epidemiological studies on meat, dairy products and egg consumption and risk of colorectal adenomas. <i>Eur J Cancer Prev.</i> 2000 Jun; 9(3): 151-164. PMID: 10954254.</p>	<p>Study design is systematic review (colorectal cancer).</p>
<p>Yuan JM, Ross RK, Gao YT, Yu MC. Fish and shellfish consumption in relation to death from myocardial infarction among men in Shanghai, China. <i>Am J Epidemiol.</i> 2001 Nov 1; 154(9): 809-816. PMID: 11682363.</p>	<p>Does not answer question: Examined relationship between fish intake and myocardial infarction.</p>

